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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/808,609

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Jean Frederic Melchior

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10/11/2006

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EXAMINER

TRIEU, THAI BA

ART UNIT

PAPER NUMBER

3748

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

100

Office Action Summary	Application No.	Applicant(s)	
	10/808,609	MELCHIOR, JEAN FREDERIC	
	Examiner	Art Unit	
	Thai-Ba Trieu	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-9, 11-24, 29-36, 39-42, 52-54 and 56-62 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-9, 11-24 and 29-36 is/are allowed.
- 6) ☒ Claim(s) 39-42, 53, 54, and 56-62 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

This Office Action is in response to the Amendment filed on August 31, 2006. Applicant's cooperation in amending the claims to overcome the claim rejections relating to indefinite claim language is also appreciated.

Claims 5-9, 11-24, 29-36, 39-42, and 52-54 were amended; claims 1-4, 10, 25-28, 37-38, 43-51, and 55 were cancelled; and claims 56-62 were newly added.

Claim Objections

Claims 40 and 53 are objected to because of the following informalities:

- In claim 40, line 51; and claim 53, line 13 "**of**" before "**combustive charge**" should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 40 and its dependent claims 42, 56, and 60; and claim 54 and its dependent claims 57 and 62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 40 recites the limitation "**said nozzles**" after "**the cylinder by**", in line 51. There is insufficient antecedent basis for this limitation in the claim.

Claim 54 recites the limitation **"said nozzles"** after **"the cylinder by"**, in line 19.

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 58 is rejected under 35 U.S.C. 102(b) as being anticipated by Brown, Jr. (Patent Number 4,187,823).

Brown discloses a reciprocating engine (10) including a cylinder (12) , a cylinder head (Not Numbered) having intake pipes (36), and intake valves (14) to selectively open or close an end of each intake pipe (36), wherein the cylinder head is adapted to accommodate the valve head of each valve such that at least at the beginning of the opening of each valve a flow opening is created between the valve head and the end of the pipe only in an angular sector about the axis of the valve (22), the angular sector of the intake valve being oriented relative to the cylinder (12) to impart a tangential flow to an incoming gas about the axis of the cylinder (See Figures 3-4, Abstract, Column 1, lines 35-57, Column 2, lines 10-68, and Column 3, lines 1-20).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 39 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (Patent Number EP 1 138 928 A2), in view Brown, Jr. (Patent Number 4,187,823), and further in view of Nelson (Patent Number 1,370,346).

Kim discloses a 4-stroke reciprocating engine used between a minimum speed of rotation N_{min} and a maximum speed N_{max} , comprising:

a turbocharging unit (18,20) which:

a compressor (18) , which supplies the intake manifold (22) of the engine with air via a cooler (24) (See Figures 1 and 3-4, and Paragraph [0013]);

a turbine (20) which is supplied with gas by the exhaust manifold (26) of the engine at the exhaust temperature, the turbine defining an exhaust outlet section S_d offered to said hot exhaust gas (See Figures 1 and 3-4, and Paragraph [0013]);

an EGR bypass (28) provided between the intake manifold (22) and the exhaust manifold (26) dimensioned to transfer a flow of exhaust gas to the intake manifold without significant loss of pressure;

such that a turbine inlet pressure substantially equal to the compressor discharge pressure (See Paragraph [0014])

such that, at constant air temperature and with a constant value exhaust outlet section, the turbocharging delivers a substantially constant volume of cooled air V_c when the compressor discharge pressure varies, the constant volume of cooled air V_c being substantially proportional to an exhaust section S_d offered to hot exhaust gases,

wherein the exhaust section S_d is selected such that

at a turbocharging adaptation speed N_a , the volume drawn in by the engine is equal to the constant volume V_c ;

below the turbocharging adaptation speed N_a , the volume drawn in by the engine is less than the constant volume V_c , and a flow of the cooled air is deflected toward the turbocharging unit through the EGR bypass;

above the turbocharging adaptation speed N_a , the volume drawn in by the engine is more than the constant volume V_c , and a flow of the exhaust gas is drawn in by the engine through the EGR bypass (28) (See Paragraph [0014], lines 43-50; Paragraph [0018], and Paragraph [0019]).

However, Kim fails to disclose the structural details of the valves.

Brown, Jr. teaches that it is conventional in the art of valve control for internal combustion engines, to utilize a reciprocating engine including a flat cylinder head having intake pipes (36) and intake valves having faces on a chamber side which are

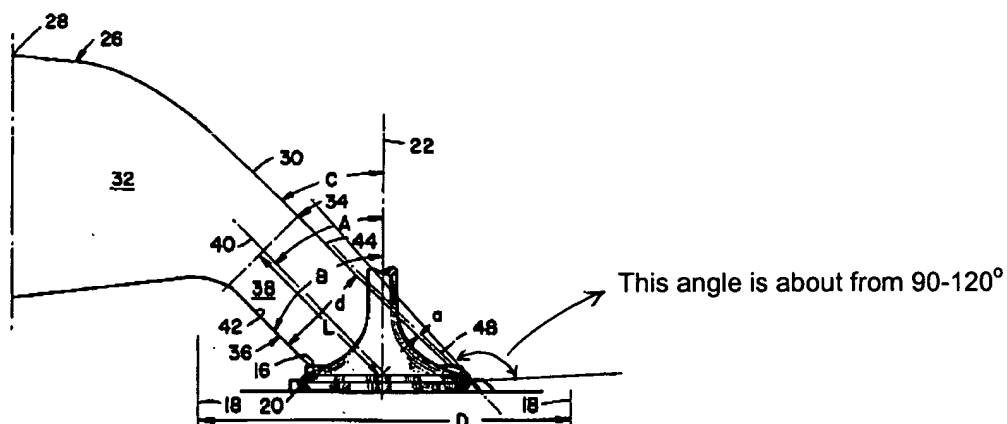
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coplanar with the cylinder head and substantially tangent to a cylinder (See Figures 3-4),

wherein each intake pipe terminates at an oblong nozzle (36) defined by an upper half-cylinder resting on an upper edge of a conical seat (16) and tangent to said seat along a generating line thereof situated in a plane substantially perpendicular to a plane passing through an axis of the conical seat (16) and through an axis of the cylinder and through a lower cylinder covering a half of a valve head of the intake valve opposite the generating line, wherein the nozzles are also oriented to create a tangential flow in a same direction in the cylinder, a combustive charge passed into the cylinder by said nozzles (36), when said nozzles (36) are in opening position; and wherein an angle of the seats is chosen to be between 90-120° to optimize a stratification of the combustive charge (See Figures 3-4, Abstract, Column 1, lines 35-57, Column 2, lines 10-68, and Column 3, lines 1-20), and

Additionally, Nelson teaches that it is conventional in the art of valve control for internal combustion engines, to utilize flat cylinder head bearing valves (B and 10).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the structural details of the valves, as taught by Brown, Jr., and the flat cylinder head bearing valves, as taught by Nelson, to improve the performance efficiency of the Kim turbocharged internal combustion engine.



Claims 40, 56 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (Patent Number EP 1 138 928 A2), in view Brown, Jr. (Patent Number 4,187,823) and Nelson (Patent Number 1,370,346), and further in view of Hammer (Patent Number 6,766,778 B2).

Kim discloses the invention as recited in the rejection of claim 39; however, Kim fails to disclose the structural details of the valves, the valve being the bearing valves, and a conical-sealing bearing surface.

Brown, Jr. teaches that it is conventional in the art of valve control for internal combustion engines, to utilize a flat cylinder head having intake pipes (36) and intake valves (14) having faces on a chamber side, which are coplanar with the cylinder head and substantially tangent to a cylinder,

wherein a conical surface of intake valves is extended towards a piston by a cylindrical part,

wherein the conical seat (16) of each intake valve is disposed at a bottom of a cylindrical recess (Not Numbered) provided in the cylinder head in order to receive the cylindrical part of the intake valves such that a flat lower face of the valve is in a plane of the cylinder head when the lower rests on the associated seats thereof, a clearance between the recess and the cylindrical part being minimal (See Figures 3-4), and

wherein each recess is provided in the cylinder head and does not go beyond the following boundaries (See Figures 3-4):

- two cylindrical portions coaxial with the cylinder and tangent externally and internally to the cylindrical recess (Not Numbered) of each valve, and
- a conical surface extending a half-seat of the valve delimited by a plane passing through an axis thereof and an axis of the cylinder;

wherein the recesses (Not Numbered) are also oriented to create a tangential flow in a same direction in the cylinder, a combustive charge passed into the cylinder by said nozzles (36), when said nozzles are in opening position; wherein the cylindrical part of each intake valve has a height slightly greater than a lift of said valve; and wherein an angle of the seats is chosen to be between 90-120° to optimize a stratification of the combustive charge (See Figures 3-4, Abstract, Column 1, lines 35-57, Column 2, lines 10-68, and Column 3, lines 1-20).

Additionally, Nelson teaches that it is conventional in the art of valve control for internal combustion engines, to utilize flat cylinder head bearing valves (B and 10).

And then, Hammer teaches that it is conventional in the art of valve control for internal combustion engines, to utilize a conical sealing bearing surface (See Column 2, lines 58-65 and claim 4).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the structural details of the valves, as taught by Brown, Jr.; the flat cylinder head bearing valves, as taught by Nelson; and a conical sealing bearing surface, as taught by Hammer, to improve the performance efficiency of the Kim turbocharged internal combustion engine.

Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (Patent Number EP 1 138 928 A2), in view Brown, Jr. (Patent Number 4,187,823) and Nelson (Patent Number 1,370,346), and further in view of Daub (Patent Number 3,056,392).

The modified Kim discloses the invention as recited above; however, fails to disclose two diametrically opposed intake valves.

Daub teaches that it is conventional in the internal combustion engine art, to utilize two diametrically opposed intake valves (16, 17) (See Figure 8, claims 19 and 21).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized two diametrically opposed intake valves, as taught by Daub, to improve the efficiency of the modified Kim device.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (Patent Number EP 1 138 928 A2), in view Brown, Jr. (Patent Number 4,187,823), Nelson (Patent Number 1,370,346), and Hammer (Patent Number 6,766,778 B2). and further in view of Daub (Patent Number 3,056,392).

The modified Kim discloses the invention as recited above; however, fails to disclose two diametrically opposed intake valves.

Daub teaches that it is conventional in the internal combustion engine art, to utilize two diametrically opposed intake valves (16, 17) (See Figure 8, claims 19 and 21).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized two diametrically opposed intake valves, as taught by Daub, to improve the efficiency of the modified Kim device.

Claims 53 and 61 rejected under 35 U.S.C. 103(a) as being unpatentable over in view Brown, Jr. (Patent Number 4,187,823), in view of Nelson (Patent Number 1,370,346).

Brown, Jr. discloses a reciprocating engine including a flat cylinder head having intake pipes (36) and intake valves (14) having faces on a chamber side which are

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coplanar with the cylinder head and substantially tangent to a cylinder (See Figures 3-4),

wherein each intake pipe terminates at an oblong nozzle defined by an upper half-cylinder resting on an upper edge of a conical seat (16) and tangent to said seat along a generating line thereof situated in a plane substantially perpendicular to a plane passing through an axis of the conical seat (16) and through an axis of the cylinder and through a lower cylinder covering a half of a valve head of the intake valve opposite the generating line, wherein the nozzles are also oriented to create a tangential flow in a same direction in the cylinder, a combustive charge passed into the cylinder bay said nozzles(36), when said nozzles are in an opened position; and wherein an angle of the seats is chosen to be between 90-120° to optimize a stratification of the combustive charge (See Figures 3-4, Abstract, Column 1, lines 35-57, Column 2, lines 10-68, and Column 3, lines 1-20).

However, Brown, Jr. fails to disclose the valves being bearing valves.

Nelson teaches that it is conventional in the art of valve control for internal combustion engines, to utilize flat cylinder head bearing valves (B and 10).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the flat cylinder head bearing valves, as taught by Nelson, to improve the performance efficiency of the Brown, Jr. valves.

Claims 54, 57 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view Brown, Jr. (Patent Number 4,187,823), in view of either Nelson (Patent Number 1,370,346), and further in view of Hammer (patent Number 6,766,778 B2).

Brown, Jr. discloses a reciprocating engine including a flat cylinder head having intake pipes (36) and intake valves (14) having faces on a chamber side which are coplanar with the cylinder head and substantially tangent to a cylinder (See Figures 3-4),

wherein a conical surface of intake valves is extended towards a piston by a cylindrical part,

wherein the conical seat (16) of each intake valve is disposed at a bottom of a cylindrical recess (Not Numbered) provided in the cylinder head in order to receive the cylindrical part of the intake valves such that a flat lower face of the valve is in a plane of the cylinder head when the lower rests on the associated seats thereof, a clearance between the recess and the cylindrical part being minimal (See Figures 3-4), and

wherein each recess is provided in the cylinder head and does not go beyond the following boundaries (See Figures 3-4):

- two cylindrical portions coaxial with the cylinder and tangent externally and internally to the cylindrical recess (Not Numbered) of each valve, and

- a conical surface extending a half-seat of the valve delimited by a plane passing through an axis thereof and an axis of the cylinder;

wherein the recesses (Not Numbered) are also oriented to create a tangential flow in a same direction in the cylinder, a combustive charge passed into the cylinder by said nozzles (36), when said nozzles are in opening position; wherein the cylindrical part of each intake valve has a height slightly greater than a lift of said valve; and wherein an angle of the seats is chosen to be between 90-120° to optimize a stratification of the combustive charge (See Figures 3-4, Abstract, Column 1, lines 35-57, Column 2, lines 10-68, and Column 3, lines 1-20).

However, Brown, Jr. fails to disclose the bearing valves, and a conical-sealing bearing surface.

Nelson teaches that it is conventional in the art of valve control for internal combustion engines, to utilize flat cylinder head bearing valves (B and 10).

Additionally, Hammer teaches that it is conventional in the art of valve control for internal combustion engines, to utilize a conical sealing bearing surface (See Column 2, lines 58-65 and claim 4).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the flat cylinder head bearing valves, as taught by Nelson, and a conical sealing bearing surface, as taught by Hammer, to improve the performance efficiency of the Brown, Jr. valves.

Allowable Subject Matter

Claims 5-9, 11-24, and 29-36 are allowed.

Response to Arguments

Applicant's arguments with respect to claims 5-9, 11-24, 29-36, 39-42, 52-54, and 56-62 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Nishimura et al. (US Patent Number 6,431,140 B1) disclose an intake port shape of internal combustion engine.
- Melchior (US Patent Number 5,014,663) discloses a two-stroke internal combustion engine and a cylinder head for the latter.
- Kirby (US Patent Number 4,744,340) discloses a vortex generator intake valve and a system using the same.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (571) 272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TTB
October 04, 2006



Thai-Ba Trieu
Primary Examiner
Art Unit 3748